

(19) World Intellectual Property Organization  
International Bureau(43) International Publication Date  
13 September 2001 (13.09.2001)

PCT

(10) International Publication Number  
WO 01/66055 A1

(51) International Patent Classification<sup>7</sup>: A61F 13/15 (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW.

(21) International Application Number: PCT/US00/33011 (84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

(22) International Filing Date: 6 December 2000 (06.12.2000)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data: 09/519,096 6 March 2000 (06.03.2000) US

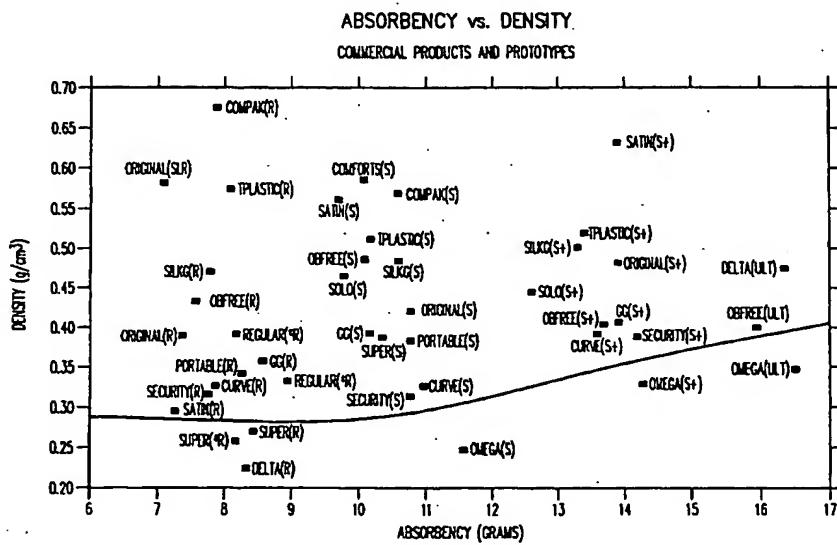
(71) Applicant: PLAYTEX PRODUCTS, INC. [US/US]; 300 Nyala Farms Road, Westport, CT 06880 (US).

(72) Inventors: PAULEY, Suzanne, M.; 1700 N. DuPont Highway, Dover, DE 19901 (US). WILLIAMS, Karla; 102 Munsey Road, Emerson, NJ 07630 (US). BROWN, Jeffrey, M.; 377 Wyckoff Avenue, Ramsey, NJ 07446 (US).

(74) Agent: RUGGIERO, Charles, N., J.; Ohlandt, Greeley, Ruggiero & Perle, LLP, One Landmark Square, Stamford, CT 06901-2682 (US).

## (54) Title: PRE-EXPANDED TAMPON PLEDGET

WO 01/66055 A1



(57) Abstract: A pre-expanded tampon pledget having a length comparable to known, compressed tampon pledgets, yet having a diameter from about 25 % to about 45 % larger than the known tampon pledgets. In addition, this tampon pledget has a fiber content from about 10 % to about 25 % less than the known tampon pledgets. This pre-expanded pledget has a density about one-third less than the known tampon pledgets and, accordingly, is softer and more comfortable. It is also less expensive to manufacture since fewer fibers are used. Nonetheless, the pre-expanded tampon pledget is about equally absorbent, and has better leakage protection than the comparable known tampon pledgets.

## PRE-EXPANDED TAMPON PLEDGET

### BACKGROUND OF THE INVENTION

5

#### 1. Field of the Invention

The present invention relates generally to an improved tampon or tampon pledget. More particularly, the present invention relates to a 10 tampon pledget that is pre-expanded. Furthermore, the pre-expanded tampon pledget has less density and, preferably, has fewer fibers, yet provides the same or improved leakage protection and performance as known, compressed tampon pledges.

15 Tampon pledges are typically compressed either during manufacture or prior to placement in a tampon applicator. These tampon pledges normally have their fibers compressed to enable easy ejection of the tampon pledget from the applicator and, more importantly, easy insertion of the tampon pledget. In such a tampon pledget, the pledget's 20 fibers will expand significantly upon initial contact with moisture. Once expanded, the tampon pledget will eventually conform to the body's contours to provide leakage protection. Conventionally, more fibers have been included, thereby increasing density (fibers per unit volume), in order to achieve better leakage protection. Such an increase in fibers normally 25 results in a more tightly compressed tampon pledget.

Heretofore, there has been a lack of appreciation of the benefits of providing a tampon pledget that is less dense and, thus, has fewer fibers per unit volume. In addition, there has been a lack of appreciation that 30 lower density or fewer fibers per unit volume may improve leakage protection.

**SUMMARY OF THE INVENTION**

It is an object of the present invention to provide a tampon pledge 5 that has less density than known tampon pledges.

It is another object of the present invention to provide such a tampon pledge that has less density, yet has improved leakage protection than known tampon pledges.

10

It is a further object of the present invention to provide such a tampon pledge that is comfortable and softer.

15

It is still a further object of the present invention to provide such a tampon pledge that is less costly than known tampon pledges.

20

Accordingly, the present invention provides a pre-expanded tampon pledge that contains absorbent fibers, preferably within a coverstock. This pre-expanded pledge contains fibers that are not tightly compressed and have fewer fibers per unit volume than a comparably sized compressed tampon pledge. Moreover, this pre-expanded tampon pledge preferably has density approximately one-third less than compressed tampon pledges of comparable volume.

**25 DESCRIPTION OF THE INVENTION**

The tampon pledge of the present invention is called a pre-expanded tampon pledge. As used in this application, pre-expanded means that the tampon or tampon pledge in its initial condition, such as 30 just prior to use, has an expanded or larger diameter, and thus volume, yet a lower density, than a conventional or known tampon pledge in its initial condition. However, when fully expanded after absorption of fluid, this pre-expanded tampon pledge and the conventional or known tampon pledges have about the same diameter.

The length of the pre-expanded tampon pledge is preferably approximately the same length as known tampon pledges. The pre-expanded tampon pledge of the present invention can be crimped or 5 compressed to a certain extent. However, the pre-expanded tampon pledge of the present invention has a diameter in its initial condition from about 25% to about 45% larger than known tampon pledges in the same absorbency range. Preferably, the diameter is about 41% larger than any known tampon pledge in the same absorbency range.

10

By simply enlarging the diameter of this pre-expanded tampon pledge while maintaining the same amount of fiber, the tampon pledge is less dense. However, to improve the benefits of this pre-expanded tampon pledge, the pledge has from about 10% to about 25% less fiber, preferably 15 about 10% to about 20%, than is used in any known tampon pledge of comparable absorbency. Thus, this pre-expanded tampon pledge has a much lower fiber density than any presently known tampon pledge. As used in this application, density means the total weight of fibers per unit volume.

20

Since density is the weight of the fiber or fibers per unit volume and the length of the pre-expanded tampon is basically the same as known tampon pledges, the pre-expanded tampon pledge according to the present invention has a volume that is proportional to the diameter squared. Accordingly, the pre-expanded tampon pledge of the present invention, in its initial condition, is about 25% to about 45%, and more 25 preferably about 41%, greater in volume than known tampon pledges of comparable length and in a comparable absorbency range. This is due to the greater diameter of this pre-expanded tampon pledge.

30

When the volume of the pre-expanded tampon pledge is increased beyond approximately 45% over known tampon pledges, insertion comfort can be compromised. In addition, when the volume of the pre-expanded tampon pledge is only increased to about 17% or less over known tampon

pledgets, there has not been found to be a benefit in leakage protection.

As stated above, to maximize its benefits, this pre-expanded tampon  
pledget has from about 10% to about 25% fewer fibers per unit volume  
5 than known tampon pledgets. Preferably, the pre-expanded tampon  
pledget has from about 10% to about 20% less fiber per unit volume than  
known tampon pledgets.

In a preferred embodiment, the fiber present in the pre-expanded  
10 plegget is much less compressed than the fiber in known tampon pledgets.  
In the most preferred embodiment of the present invention, the fiber in the  
pre-expanded tampon plegget may be as much as about three times less  
compressed than the fiber in known tampon pledgets.

15 Despite the much lower fiber density, as well as less compression,  
this pre-expanded tampon plegget unexpectedly provides protection  
against leakage that is comparable or better than known tampon pledgets.

The pre-expanded tampon plegget is also softer and more flexible  
20 than present tampon pledgets due to lower fiber density. Accordingly, this  
tampon plegget is comfortable to insert and during wear, and is believed  
more comfortable than known tampon pledgets. Also, the initial, pre-  
expanded condition of this tampon plegget can make the plegget conform  
more quickly to the user since less moisture is needed to contact the  
25 plegget to cause the expansion found in known tampon pledgets.

In short, by enlarging the tampon plegget's diameter (pre-expanded)  
and removing up to about 25% of the fiber, the density is greatly  
decreased, yet leakage protection is unexpectedly improved. To achieve a  
30 preferred reduction in fiber density between about 25% to about 45%,  
which is approximately one-third less than present tampon pledgets  
comparable volume, there preferably should be about 10% to about 25%  
less fiber, more preferably about 10% to about 20% less fiber in the pre-  
expanded tampon plegget.

It should be understood that the above applies to a pre-expanded plegget without the effect of a coverstock. However, the pre-expanded plegget can be used with a coverstock. The coverstock can be any 5 conventional coverstock, such as, for example, spunbonded polypropylene. It can also be any special type of coverstock. Also, the coverstock can entirely cover or partially cover the tampon plegget. However, the coverstock should not impinge upon the pre-expanded state of the tampon plegget.

10

Tests have demonstrated the performance of the tampon plegget made in accordance with the present invention. The graph shown in Fig. 1 illustrates a syngyna test of known tampons versus pre-expanded tampons of various diameters.

15

The several tampon pleggets of the present invention are designated as Delta Regular(R), Super Regular(R), Omega Super(S), Super Plus(S+), and Omega Ultra (ULT). These pleggets have the following weight of fibers and initial diameter.

20

		Weight of fibers	Diameter
	<u>Tampon Plegget</u>	<u>per gram</u>	<u>(inches)</u>
	Delta Regular	1.87	0.67
	Super Regular	2.05	0.62
25	Omega Super	2.50	0.73
	Omega Super Plus	3.15	0.73
	Omega Ultra	3.95	0.73

The commercial products tested include three Regular(R), Super(S) 30 and Super Plus(S+) for products under the following trademarks/names: Satin Touch, Silk Glide and Gentle Glide, all nine tampons are distributed by Playtex Products, Inc.; OB Free Regular(R), Super(S) and Ultimate(ULT), all three of which are sold by Personal Products Company, Kotex Security Regular(R), Super(S) and Super Plus(S+), all three of which

are sold by Kimberly Clark Corp. It should be noted that all Personal Products company, Kimberly Clark Corp and Playtex Products, Inc. Silk Glides products have coverstocks. However, the coverstocks should not effect the data provided above.

5

Fig. 1 is a plot of density in grams versus absorbency in grams. The density numbers are dry numbers. As shown in the plot, the present invention has the only tampons with a density of 0.29 grams/cm<sup>3</sup> or less in all absorbency ranges. In fact, the absorbency remains relatively constant 10 from about 6 grams to about 10.7 grams.

At about 10.5 grams of absorbency, the plot increases 0.02 grams/cm<sup>3</sup> of density for every one gram of absorbency. The tampon pledges of the present invention remain below that line throughout the plot. 15 Thus, the tampon peldorf of the present invention in any point of the absorbency range commencing from about 10.5 grams and greater has a density less than known tampon pledges. Even at this range, the pre-expanded tampons illustrate improved absorbency per unit of density.

20 It should be noted that since the amount of fiber in each pre-expanded tampon peldorf is decreased, the cost of the finished tampon peldorf is decreased.

25 The pre-expanded tampon peldorf of the present invention is preferably of cross-pad construction. However, the pre-expanded tampon peldorf can also have a flat pad or rolled construction.

30 Various modifications may be made as will be apparent to those skilled in the art. Thus, it will be obvious to one of ordinary skill in the art that the foregoing description is merely illustrative of certain preferred embodiments of the present invention, and that various obvious modifications can be made to these embodiments.

What is claimed is:

1. A tampon pledge having a density of about 0.29 grams per cubic centimeter or less, and an absorbency from about 6 grams and 5 greater.
2. The tampon pledge of claim 1, wherein the tampon pledge has from about 10% to about 25% less fiber than any known tampon pledge.
- 10 3. The tampon pledge of claim 1, wherein the tampon pledge has from about 10% to about 20% less fiber than any known tampon pledge.
- 15 4. The tampon pledge of claim 1, wherein the tampon pledge has from about 10% to about 25% less fiber per unit volume than any known tampon pledge.
5. The tampon pledge of claim 1, wherein the tampon pledge has from about 10% to about 20% less fiber per unit volume than any known tampon pledge.
- 20 6. The tampon pledge of claim 1, wherein the tampon pledge has fiber that is less compressed than fiber in any known tampon pledge.
- 25 7. The tampon pledge of claim 1, wherein the tampon pledge has a reduction in fiber density between about 25% and about 45%.
8. The tampon pledge of claim 1, wherein the tampon pledge has a reduction in fiber density of about 41%.
- 30 9. The tampon pledge of claim 1, wherein the tampon pledge has a reduction in fiber density between about 25% to about 45%, and about 10% to about 25% less fiber than any known tampon pledge.
10. The tampon pledge of claim 1, wherein the density remains

relatively constant from about 6 grams to about 10.7 grams syngyna absorbency.

11. The tampon pledge of claim 1, wherein the tampon pledge  
5 has a cross-pad construction.

12. The tampon pledge of claim 1, wherein the tampon pledge  
has a radial construction.

10 13. The tampon pledge of claim 1, further comprising a  
coverstock about at least a portion of the tampon pledge.

14. The tampon pledge of claim 1, further comprising a  
coverstock about the tampon pledge.

15 15. A pre-expanded tampon pledge that has in any point of an  
absorbency range commencing from about 10.5 grams and greater, a  
density less than any known tampon pledge.

20 16. A pre-expanded tampon pledge, the tampon pledge  
comprising:

from about 10% to about 25% less fiber than any known tampon  
pledge;

25 a reduction in fiber density between about 25% to about 45% than  
the known tampon pledge,

30 wherein the tampon pledge will have a fiber density of about 0.29  
grams per cubic centimeter or less, for any absorbency from about 6 grams  
and greater.

17. The tampon pledge of claim 16, wherein the absorbency  
remains relatively constant from about 6 grams to about 10.7 grams.

18. The tampon pledge of claim 16, wherein the tampon pledge has from about 10% to about 20% less fiber than the known tampon pledge.

5

19. The tampon pledge of claim 16, wherein the tampon pledge has a reduction in fiber density of about 41%.

20. The tampon pledge of claim 1, further comprising a  
10 coverstock about at least a portion of the tampon pledge.

1/1

ABSORBENCY vs. DENSITY  
COMMERCIAL PRODUCTS AND PROTOTYPES

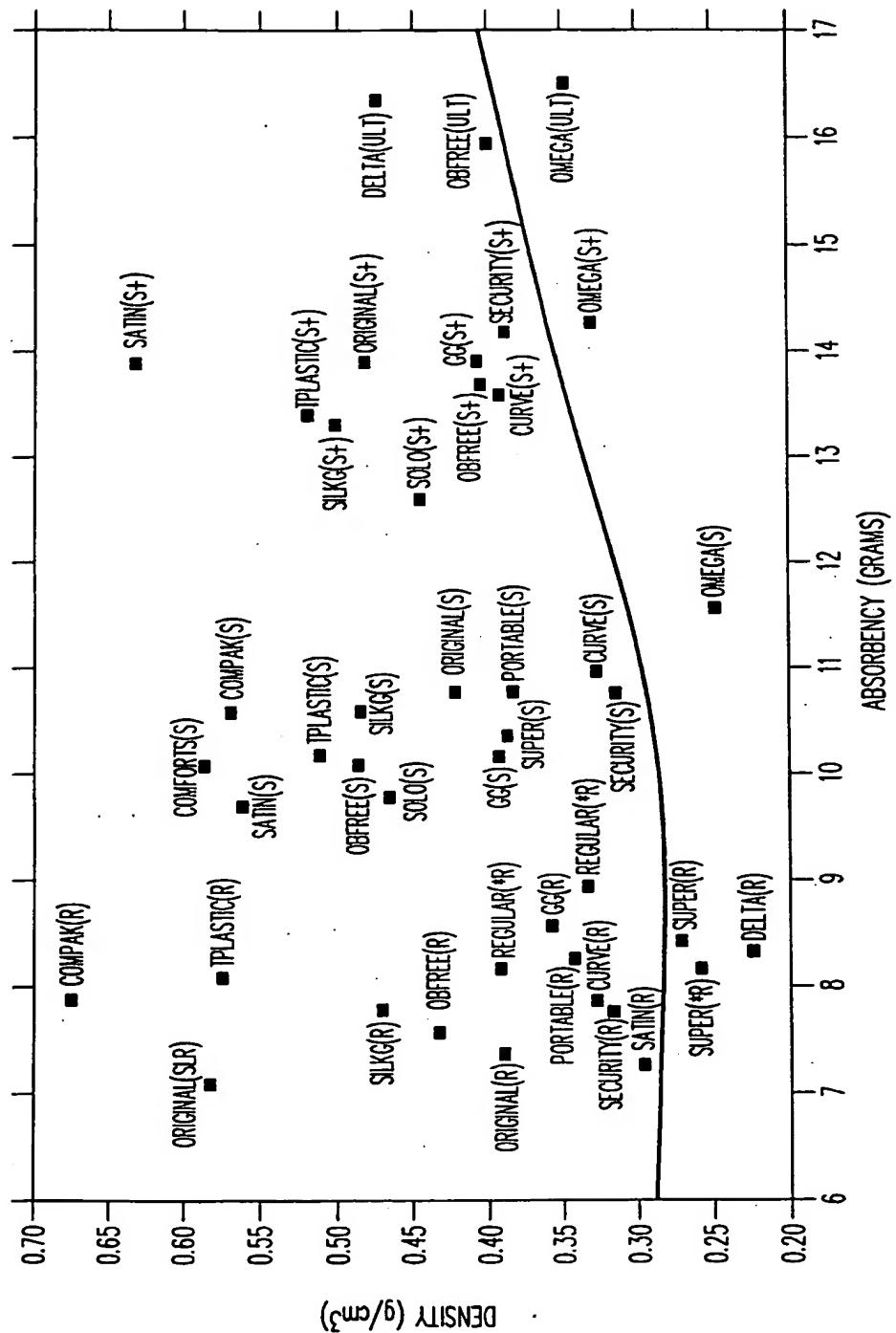


FIG. 1

SUBSTITUTE SHEET (RULE 26)

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US00/33011

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : A61F 13/15  
US CL : 604/904

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 604/904, 385.17, 385.18, 385.01

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched  
noneElectronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
East text search

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4,543,098 A (Wolfe et al.) 24 September 1985, see entire document	1,11-14

Further documents are listed in the continuation of Box C.  See patent family annex.

Special categories of cited documents:	
"A"	document defining the general state of the art which is not considered to be of particular relevance
"E"	earlier document published on or after the international filing date
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O"	document referring to an oral disclosure, use, exhibition or other means
"P"	document published prior to the international filing date but later than the priority date claimed
"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&"	document member of the same patent family

Date of the actual completion of the international search  21 FEBRUARY 2001	Date of mailing of the international search report  13 MAR 2001
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer  DENNIS RUHL Telephone No. (703) 308-2262

**INTERNATIONAL SEARCH REPORT**

International application No.

PCT/US00/33011

**BOX I. OBSERVATIONS WHERE CLAIMS WERE FOUND UNSEARCHABLE****2. Where no meaningful search could be carried out, specifically:**

These claims are reciting a tampon in relation to "any known tampon pledge" and because of this the scope cannot be determined. It is not known what this phrase means and therefore a search cannot be made if it is not known what is being claimed. These claims are extremely unclear and no meaningful search could be conducted.

1. Discussion of Inner Tube
2. Dimensions of the tampon applicator
  - a. measure depth from the leading edge/depth in three ways
    - i.) when the second end of the tampon is in contact with the first end of the inner member
    - ii.) when the inner member is embedded in the tampon (the inner member is within the tampon)
    - iii.) when the tampon is embedded in the inner tube
3. Outer member is optional
4. Tampon positioning member is optional